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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
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1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,333	LONING ET AL.	
	Examiner	Art Unit	
	THOMAS BENNETT MCKENZIE	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *1-10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 01/15/2010 have been fully considered but they are not persuasive.

2. On page 3 of The Arguments, Applicant asserts that the prior art teaches either cooling or purification. The Examiner respectfully disagrees. On page 4 of Janzen (DD 145540), DMT is stored in a preheater at a temperature of 170°C. The molten DMT is then fogged with inert gas and then separated using a glycol barrier liquid in the temperature range of 20-160°C. This process is intended to separate DMT from the inert gas (Janzen, p. 3, first paragraph), so clearly separation occurs. Since DMT is initially 170°C in the preheater, it would have been obvious to one of ordinary skill in the art for the glycol contacting process to also cool the off-gas since the glycol contacts the off-gas in the temperature range of 20-160°C.

3. Also on page 3, Applicant asserts that Serenkov does not describe cooling. Although the Examiner respectfully disagrees (cooling is obvious based on the fact that the transesterification of Serenkov occurs between 150-200°C while washing with 1,4-butanediol occurs between 100-150°C (pages 4 and 5)), the purpose of introducing Serenkov was to demonstrate that 1,4-butanediol is capable of removing DMT from a gas stream. The proper temperature ranges would be employed when 1,4-butanediol is used in combination with Janzen.

4. On page 5 of The Arguments, Applicant asserts that Fike would not be combinable with Janzen. The Examiner, again, respectfully disagrees. Although Fike

does not necessarily teach contacting ethylene glycol with PET off-gas at the temperature range described in Janzen, Fike does teach that ethylene glycol is used to treat PET off-gas (column 5, lines 1-10). In combination with Janzen, ethylene glycol would be used to treat PET off-gas within the same temperature ranges as claimed by the Applicant.

5. Again on page 5 of The Arguments, the Applicant asserts that Janzen does not suggest quenching. The Examiner disagrees. As will become clearer further in the Action, it would have been obvious to one of ordinary skill in the art for this process to cool and thereby quench the treated gas stream.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 11-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Janzen et al, DD145540A (Janzen).

4. Regarding **claim 11**, Janzen substantially teaches a process for purifying (p. 2, first paragraph) and cooling (p. 4, first paragraph and p. 3, second paragraph) a gas stream comprising a dialkyl ester A) of an aromatic dicarboxylic acid (DMT, p. 2, first paragraph), which comprises treating the gas stream with a dihydroxy compound B) (glycol, p.3, second paragraph) at a temperature between 20-160°C which reads on the claimed range of a temperature less than/equal to the melting point of the dialkyl ester A) in a first stage (p. 3, second paragraph) wherein the dihydroxy compound B) (glycol) has a temperature between 20-160°C (p.3, second paragraph) which reads on the claimed range of less than/equal to 140˚C in the first stage (p.3, second paragraph).

5. Note that Janzen does not teach treating the gas stream with an aliphatic dihydroxy compound B) at above the melting point of the dihydroxy compound B) in at least one second stage, wherein the dihydroxy compound B) has a temperature from 20 to 80°C in the second stage. However, the object of Janzen is to "ensure complete reuse of DMT sublimate" (p. 3, second paragraph). Additionally, the dihydroxy compound (glycol) of Janzen contacts the dialkyl ester (DMT) in a temperature range between 20-160°C (p. 3, paragraph 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to repeat the first stage cooling within the disclosed temperature range to ensure a high yield recovery.

6. Regarding **claim 12**, Janzen teaches the dialkyl ester A) is an ester of terephthalic acid, isophthalic acid, 2,6-naphthalendicarboxylic acid or mixture thereof

(dimethyl terephthalate, p.2, first paragraph). Note that dimethyl terephthalate is an ester of terephthalic acid.

7. Regarding **claim 13**, Janzen teaches a dialkyl ester A) having alkyl radicals having from 1 to 4 carbon atoms (dimethyl terephthalate, p.2, first paragraph). Note also that dimethyl terephthalate contains two lkyl radical carbon atoms.

8. Regarding **claim 14**, Janzen teaches a the gas stream that is purified to be a laden inert gas stream (Janzen translation, p.2, lines 6-7; p.3, lines 1-2).

9. Regarding **claim 17**, Janzen et al teaches a dialkyl ester A) used being dimethyl terephthalate (dimethyl terephthalate, Janzen translation, p.2, line 1).

10. Regarding **claims 18 and 19**, while the reference is silent to the degree of saturation of the gas stream with respect to the dialkyl ester after purification and cooling, note that the claimed amounts are well known in the art for optimal purification and cooling and it would have been obvious to one of ordinary skill in the art at the time the invention was made to so include for this benefit.

11. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Janzen in view of Fike et al, USP 6,312,503 (Fike).

12. Regarding **claim 15**, Janzen substantially teaches the dihydroxy compound used is glycol (p. 3, second paragraph). Glycol is a generic term for dihydric acid, and could conceivably contain 2 to 6 carbons.

13. In an analogous art of separating impurities from an off-gas in the production of PET, Fike teaches using ethylene glycol to remove impurities from an inert gas stream (column 1, lines 5-25). It would have been obvious to one of ordinary skill in the art at

the time of the invention to use ethylene glycol as the glycol described in Janzen for the benefit improving removal efficiency (column 2, lines 60-65).

14. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Janzen in view of Serenkov et al, DD 160829 (Serenkov).

15. Regarding **claim 16**, Janzen substantially teaches a dihydroxy compound B) used being glycol (glycol, p.3, second paragraph). Note that glycol is a generic term for dihydric acid. Note also that Janzen does not explicitly teach using 1,4-butanediol as the dihydroxy compound B).

16. In an analogous art of separating impurities from an off-gas in the production of PET, Serenkov substantially teaches using 1,4-butanediol to remove DMT from a gas stream (page 4, fourth paragraph). It would have been obvious to one of ordinary skill in the art to use 1,4-butanediol with the process of Janzen for the benefit of increasing productivity.

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS BENNETT MCKENZIE whose telephone number is (571) 270-5327. The examiner can normally be reached on Monday-Thursday 7:30AM-5:00PM Alt. Friday 7:30AM-4:00PM EST..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DUANE SMITH can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Duane Smith/
Supervisory Patent Examiner, Art Unit 1797

TBM